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EXAMINER

LAROSE, COLIN M

ART UNIT	PAPER NUMBER
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2624

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10/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/845,349

Applicant(s)

ISHII, HIROTOMO

Examiner

Colin M. LaRose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 12 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/15/07.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10 September 2007 has been entered.

Response to Amendments and Arguments

2. Regarding claim 1, the "first condition" corresponds to "absolute positions of pixels in the image." As shown in figure 5 of the Specification, the first condition, e.g., specifies every third pixel as meeting the condition—this is analogous to a subsampling of the image that retains every third pixel at regular intervals and discards or ignores the remaining two-thirds of the pixels.

The "second condition" corresponds to "positions of pixels relative to a target pixel." As shown in figure 6, the second condition, e.g., specifies four pixels relative to the target pixel—the 3-, 6-, 7-, and 9-numbered pixels from the target pixel 510.

As shown in figure 6, the circles represent pixels satisfying the first condition, and the triangles represent pixels satisfying the second condition. Only the 7th pixel from the target pixel satisfies both conditions.

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Huang is considered to disclose the "first condition" insofar as Huang subsamples the input image data 21 via a conventional subsampling process that retains only a subset of the pixels in the image.

Huang is also considered to disclose the "second condition" insofar as Huang specifies a number of pixels relative to a target pixel. In figure 5, "lag" pixels 4-7 are relative to a target pixel 0 and are used to determine a threshold for binarizing the image data (see column 7/5-19).

Applicant asserts that Huang does not disclose, "selecting at least one related pixel which satisfies the stored first condition and the stored second condition relative to the selected target pixel." Specifically, Applicant maintains that Huang's threshold determining unit 45 (figure 4) operates on the input image data 21 prior to subsampling, and accordingly, the lag pixels that are used to determine the threshold are not subsampled pixels, i.e., they are not subject to the "first condition."

Applicant's remarks concerning the above characterization of Huang have been considered. Examiner respectfully disagrees with Applicant's characterization for the reasons stated in Paragraph 2 of the Final Rejection and for the additional reasons that follow:

Huang's pixel buffer pipe 42, in addition to subsampling the input image data 21, "is also used in a dynamic determination of foreground threshold values by the threshold determination unit 45" (column 6/50-54). As shown in figure 5, "[t]he pixel labeled 0 (zero) is the current pixel being processed while pixels labeled 1 to 7 are yet to be processed as the current pixel" (column 6/60-62) (emphasis added).

"Pixels enter 56 the pixel buffer pipe 42 so that a new pixel entering starts with label 7 (seven) and is progressed along the buffer pipe 42 to the label of 0 (zero) with each additional pixel entering the buffer pipe 42. Upon processing current pixel (pixel labeled 0) the pixel is sent to the thresholding binary buffer 43" (column 6/66—7/4).

Accordingly, Huang teaches that figure 5 illustrates the processing of a current pixel 0 whereby the lag pixels 4-7 are used to determine the threshold. After processing the current pixel 0, the pixel is sent to the thresholding buffer 43. Thereafter, each of the "yet to be processed pixels" 1-7 are successively shifted into the "current pixel" position (or otherwise considered as the current pixel) and are processed in the same manner. After processing, each pixel is sent to the thresholding buffer 43.

The only plausible conclusion is that the pixels shown in figure 5 correspond to the inputted pixels 21 *after* subsampling. If subsampling had not been performed prior to "processing" each pixel, then not all of the pixels would be processed and sent to the thresholding buffer 43 because some of the pixels 1-7 would supposedly be discarded during the subsampling operation.

Since Huang characterizes each of the pixels 1-7 are pixels *yet to be processed*, it is apparent that these pixels are to be processed and sent to the thresholding buffer 43 in the same manner as the current pixel 0. It follows, then, that if all of the pixel 0-7 are to be sent to the thresholding buffer 43, then the pixels must have been subjected to subsampling prior to being processed and sent to the buffer 43.

Therefore, Huang is considered to select "related pixels" satisfying both an absolute subsampling (first) condition and a relative "lag pixel" (second) condition. These selected related

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pixels are used to set a threshold that is used to binarize the current pixel under consideration, in accordance with the claimed invention.

In view of the above remarks, the previous rejections have been maintained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 6-8, 12, and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,766,056 by Huang et al. ("Huang").

Regarding claims 1, 8, and 12, Huang discloses an image processing apparatus/medium/method (12, figure 1) comprising:

an input unit (scanner 11, figure 1) for inputting image data of an image composed of a plurality of pixels, each having a color data (color image data is input to the pixel buffer pipe 42 via an input device; column 6, lines 19-21);

a storage unit (42, figure 4) for storing a first condition on absolute positions of pixels in the image and a second condition on positions of pixels relative to a target pixel (first condition: the pixel buffer pipe receive subsampling signals from the sub-sample control module 41 and subsamples the image based on those signals; the resulting image is a down-sampled version of the original that contains only a subset of the original pixels; the pixels to be retained after

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subsampling constitute the first condition on absolute positions of pixels in the image; see column 6, lines 22-30 and 50-54; second condition: in figure 5, a number of “lag” pixels relative to a target pixel (“0”) are identified; the designation of these pixels constitutes the second condition on positions of pixels relative to a target pixel; see column 6, lines 55-67);

a selector (45, figure 4) for selecting a target pixel included in the image data and also selecting at least one related pixel which satisfies the stored first condition and the stored second condition relative to the selected target pixel (column 7, lines 5-25: the threshold determining unit 45 selects a target pixel 0 as well as related (lag) pixels 4-7, which must satisfy the first and second conditions – that is, the related pixels are present in the subsampled image (absolute condition), and they meet the condition of being “lag” pixels relative to the target pixel);

a binarization unit (elements 43, 44, and 48, figure 4) for binarizing the target pixel into one of two data values based upon a color data of the target pixel (i.e. color value of the target pixel is compared to threshold during the binarization process) and that of the at least one related pixel to the target pixel in the image (i.e. related pixels are used to generate the threshold) to generate a binarized value (binarized value 54A is output by the pixel count accumulator 48); and

a determination unit (22, figure 2) for determining whether or not the image has a specified pattern, based upon binarized values obtained by said binarization unit (i.e. the mark detection module 22 determines whether a specified patterns exists).

Regarding claim 2, Huang discloses the binarization unit obtains a color data for binarization based upon the color data of the target pixel and that of the at least one related pixel (column 7, lines 12-31: the “color data” obtained for binarization includes the pixel value of the target pixel, and a color threshold that is based on the related pixels), and generates the binarized value based upon whether or not the value indicated by the color data for binarization is within a predetermined range (column 7, lines 20-31 the 3-bit binarized value of the target pixel is generated based upon whether the target pixel’s color value is within the color range for a designated mark -- this 3-bit binarized value is then used to generate a binarized value 54A composed of a single bit).

Regarding claim 6, Huang discloses the determination unit determines whether or not an image element having a shape similar to the specified pattern exists, based upon the binarized values, and when the image element is determined to exist, finely examines the shape of the image element to determine whether or not the specified pattern exists (column 12, lines 42-55: the mark detector detects circle patterns, and then finely examines those circle patterns by gathering statistical parameters).

Regarding claim 7, Huang discloses that when the image element is determined to exist, the determination unit inhibits to generate an image resembling closely the image received from the input unit (column 21, lines 45-52: e.g. photocopier functions are disabled upon detecting the image element).

Regarding claims 22-24, Huang’s subsampling results in maintaining pixels in the image that are spaced at regular intervals (i.e. fixed with respect to an edge of the image), as is found in conventional subsampling.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of U.S. Patent 5,434,953 by Bloomberg.

Regarding claims 4 and 10, Huang discloses subsampling the image in order to reduce the image size, thereby defining a first condition (column 6, lines 22-30), and Huang also discloses a pixel which exists in a straight line including the target pixel extending in the predetermined direction and which is positioned within a predetermined range from the target pixel is the pixel defined in the second condition (figure 5: "lag" pixels, which are positioned within a predetermined range from the target, define the second condition).

Huang does not expressly disclose that every N pixel from a pixel at an edge of the image in a predetermined direction within the image is the pixel defined in the first condition.

However, at the time the invention was made, it was obvious to one skilled in the art that subsampling was typically effected by maintaining every Nth pixel from the edge of the original image in a predetermined direction (e.g. horizontal and vertical directions). Bloomberg teaches that "subsampling" is an operation that involves dividing an image into square blocks of pixels and then selecting a predetermined pixel from each block. The subsampled image is formed by combining each of the selected pixels, resulting in an image that includes every Nth pixel from

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the original image. Col. 4, lines 8-14. In view of Bloomberg's definition of "subsampling," whose skilled in the art would have known that Huang's subsampling constitutes maintaining every N pixel from the edge of the image in a predetermined direction within the image.

7. Claims 3 and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Huang in view of U.S. Patent 5,687,252 by Kanno et al. ("Kanno").

Regarding claim 9, Huang discloses the binarization step includes:

obtaining a color data for binarization based upon the color data of the target pixel and that of the at least one related pixel (column 7, lines 12-31: the "color data" obtained for binarization includes the pixel value of the target pixel, and a color threshold that is based on the related pixels), and

generating the binarized value based upon whether or not the value indicated by the color data for binarization is within a predetermined range (column 7, lines 20-31 the binarized value of the target pixel is generated based upon whether the target pixel's color value is within the color range for a designated mark).

Regarding claim 3 and further in regards to claim 9, Huang does not disclose the color data for binarization is obtained based upon an average value between the value of the color data of the target pixel and that of the at least one related pixel.

Rather, Huang discloses that the threshold is obtained based on only the related (lag) pixels.

Kanno discloses an image processing system that includes the binarization of image data, similar to the system of Huang. In particular, Kanno discloses a number of different binarization

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processes that may be carried out in order to binarize image data (column 4, lines 1-13). Method (5) involves calculating a threshold based on average values of both a target pixel and related pixels (see figure 9 and column 9, lines 65+). The average value of the target pixel and its related pixels within a predetermined range is then used as a threshold for binarizing the target pixel.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Huang by Kanno to include the target pixel in the calculation of the average value to be used as the threshold, since Kanno shows that calculating the average value based on both the target pixel and related pixels for the purposes of generating a threshold for binarization of a single target pixel is conventional.

Allowable Subject Matter

8. Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 5 and 11, Huang is silent to storing a third condition defining a position relative to the target pixel in a predetermined direction specified by a user, and wherein the at least one related pixel includes a pixel satisfying the third condition. Huang's system does not appear to involve any user interaction for specifying a predetermined direction corresponding to a third condition defining a position relative to the target pixel, as claimed.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner, can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.



Colin M. LaRose
Group Art Unit 2624
14 October 2007